The Use of Surveillance Data and Market Research to Promote Physical Activity

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Abstract: Using various types of data sources for assessing and monitoring physical activity behaviors on a population level adds to our ability to explain the relationships between individuals and their surrounding social and physical environments. This article presents the findings from part of a panel presentation on available data sets at the 2001 Cooper Conference on Innovative Approaches to Understanding and Influencing Physical Activity. First, an overview of large national epidemiologic and surveillance data sets is offered, followed by a discussion on the use of market segmentation data to complement more traditional sources of data by adding new dimensions to our understanding of target groups and potential intervention strategies. The relative advantages and disadvantages of using each type of data are also given, as well as recommendations for further use.

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Introduction

A weakness in physical activity intervention research efforts has been the lack of both the quantity and quality of appropriate data systems for analysis. More traditional sources of behavioral and epidemiologic data are generated for rigorous scientific inspection of health status, health problem identification, and health behavior. In addition, nontraditional market survey data can create a more complete "profile" of target groups and provide multiple points for physical activity intervention.

We begin with a presentation on the larger national epidemiologic data sets, primarily those used for surveillance purposes. In addition to the use of epidemiologic and surveillance data, efforts to further segment and profile sedentary target groups for tailored physical activity promotion interventions have focused on market research strategies and techniques. The study of the clustering of segments or similar groups of individuals based on shared characteristics, especially using geographic information system (GIS) technology, is a fairly recent endeavor.[1] This paper continues with a discus-

sion on the use of quantitative market research for physical activity promotion, using as examples the American Healthstyles survey project and PRIZM target segmentation system. Keeping with the theme of market segmentation, the article follows with an application of market survey strategy to outdoor recreation pursuits in a discussion of the National Survey on Recreation and the Environment. We conclude with a discussion of the relative merits of epidemiologic, surveillance, and market research data, and recommendations for future research efforts. Our main goal is to illustrate how these systems can be used in combination to improve the promotion of physical activity.

Available Public Health Surveillance Data for Physical Activity

Public health professionals use surveillance and epidemiologic data to define health status, identify health problems and conduct health behavior research with various populations. Several large national survey systems are used to provide descriptive data on physical activity patterns in the United States.[2] These data systems have evolved to address several areas: monitoring national health objectives, tracking trends, identifying subgroups for intervention, and providing justification for programs and policy. In general, the physical activity questions are designed to track the national health objectives as described in Healthy People 2010.[3]

The surveillance data sets that are discussed in this section include the National Health Interview Survey (NHIS), the Behavioral Risk Factor Surveillance System

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(BRFSS), and the Youth Risk Behavior Surveillance System (YRBSS). Another data set that will be described is the National Health and Nutrition Examination Survey (NHANES). Although it is not used for surveillance, it does collect physical activity information on a representative sample of the U.S. population. All of the data sets mentioned here contain physical activity data along with demographic information and data on other risk factors and health conditions. Information concerning potential mediators of physical activity is usually not available. Also, these data are cross-sectional and can be used only to identify associations within the sample population.

National Health Interview Survey

The NHIS is designed to annually collect representative data on U.S. adults. Since 1997, physical activity questions to assess moderate-intensity, vigorous-intensity, and strengthening activities have been asked of all adults annually. Prior to 1997, type of physical activity (22 possible activities), including frequency, intensity, and duration, had been asked of a subset of the national sample every 3 to 5 years (this module was used in 1985, 1990, 1991, 1995, and 1998). Because changing the questions can affect prevalence estimates of physical activity, it is important to keep the wording very close (or identical) over time, and to use similar or identical instruments in other surveys. However, as new scientific issues arise, a surveillance system should be flexible enough to accommodate changes in the measurement of key indicators such as physical activity.

While previous versions included detailed information on the type of activity every few years, the new questions provide annual information on the time spent in different intensities (moderate or vigorous). Although the psychometric properties of previous physical activity questions have not been extensively explored, reliability has been high for most subgroups,[4] while validity studies using the 1985 sample found statistically significant, but very low (less than 0.3) correlations.[5] The new questions have been through rigorous cognitive testing but validity and reliability tests have not yet been published.

In addition to basic demographics (which may have moderating effects on physical activity) and many health and risk behavior questions, information is collected on other measures, such as perceived health, social support, and life satisfaction. However, these may not be appropriate mediators for physical activity, and if they were, they would also have to be tested for reliability and validity in the context of their role as mediators. Questionnaire items are available online. Further information can be obtained at www.cdc.gov/nchs.

Behavioral Risk Factor Surveillance System

The BRFSS is a state-based telephone survey of adults that has included physical activity measures since its inception. Prior to 2001, information was collected on the frequency and duration of two specific types of leisure-time physical activity and exercise during the previous month. These questions were found to have good test–retest reliability, but validity studies have not been published.[6] Evolving scientific evidence that moderate-intensity activity has significant health benefits necessitated the changes to the questions. Beginning in 2001, a new set of questions is used in odd-numbered years to obtain information on the frequency and duration of moderate or vigorous activities and occupational activity. Reliability and validity testing on these questions is ongoing. To allow continuity and tracking of trends from the early 1980s through the 2000s even with the change in questions, one item has been retained that asks about participation in any type of physical activity or exercise during the past month.[7]

Questions that measure potential mediators and moderators for physical activity may be found within modules that are used by some of the states for some of the years. An example is the measure of perceived safety from crime included in the social context module. However, these questions are asked sporadically and of only part of the sample. New modules are being developed and included each year. It may be possible to incorporate other potential mediators and moderators in future modules, at least for initial testing. All questionnaire items and modules are available online. Further information can be obtained at www.cdc.gov/nccdphp/brfss.

Youth Risk Behavior Surveillance System

The YRBSS provides information on physical activity and other health behaviors in youth in grades nine through twelve. From these data, both state and national estimates can be obtained. Some of the physical activity information collected includes the frequency and duration of moderate and vigorous physical activity, time spent watching television on a school day, and physical activity during physical education class at school. All questionnaire items are accessible online. To obtain more information, see www.cdc.gov/nccdphp/dash/yrbss.

National Health and Nutrition Examination Survey

The NHANES is another important data set that has collected data on physical activity dating back to the early 1970s. Changes have been made throughout the years in the type of physical activity data collected, which make these data more suitable for cross-sectional association studies rather than surveillance. Even though trend data cannot be obtained, important

correlations can be made between physical activity and other variables within the time frame of data collection. The most recent data (collected in 1999–2001 and available in 2003) will include details on type and intensity of several activities as well as physical-fitness measures on a subset of the sample. In future surveys, information on environmental supports (or barriers) for physical activity will be included, so there will be greater opportunity for examining mediating effects on physical activity. The web site for further information is http://www.cdc.gov/nchs/nhanes.

The Use of Omnibus Survey and Geodemographic System Lifestyle Data

Market research can complement epidemiologic and surveillance data by adding new dimensions to our understanding of who the target groups are, and when, where, how, and what to say to them, but it can also illuminate other potential intervention strategies, such as policy initiatives. In fact, market research can be used for developing a more successful communication program with every target audience, from individuals to community leaders to state health professionals. In contrast to traditional public health efforts that often focus primarily on the health issue at hand, market research, both qualitative and quantitative, profiles target populations from various viewpoints (e.g., political beliefs, lifestyle, psychosocial characteristics, personality traits, consumer patterns, and media habits).[8] This gives intervention planners a more comprehensive "image" of a target population, and can enhance intervention planning and improve the effectiveness of behavior change strategies through focusing on the moderating and mediating effects these variables have on physical activity patterns.

American Healthstyles Survey Project

The American Healthstyles survey project is an investigation of a cross-behavior health segmentation based on social cognitive and other behavior and communication theories and models.[9] The project incorporates three linked, mail-survey questionnaires administered to a panel of adults (aged ≥18 years) annually since 1995, employing quota sampling to generate a list of approximately 5000 people who are representative of all U.S. adults. Included is a supplemental mailing to the initial survey designed to compensate for low response rates among low-income individuals and minorities (blacks and Hispanics). The entire sample is weighted (or balanced) on age, gender, marital status, race/ethnicity, income, region, household size, and population density.

The third and final survey (Healthstyles) is administered in the summer of each year to those who responded to the previous general and supplemental surveys. The Healthstyles questionnaire contains five core health areas: smoking, alcohol use, exercise/physical activity, diet and nutrition, and weight control, as well as specific health concerns (folic acid, radiation, and occupational health). The items are based on theories of health behavior and are designed to measure several mediating measures for the core health areas, including outcome expectations, self-efficacy, motivation, personal goals/behavioral intentions, perceptions of social norms, and social support. In 2001, the Healthstyles survey was sent to 5605 potential respondents, with 3719 successfully returned for a response rate of 66%. Since 1995, the combined yearly Healthstyles data set contains approximately 20,000 observations.

Previous use of Healthstyles data incorporated the transtheoretical model of behavior change to segment and profile the adult population for moderate activity and healthy eating.[10] This information was then used to develop a campaign effort by the Centers for Disease Control and Prevention (CDC) that targeted individuals in the precontemplation and contemplation stages.[11] More recent use of Healthstyles data has examined the public's support for the use of tax money for various environmental modifications promoting physical activity, including building sidewalks and other facilities for pedestrians (63.9% overall approval); building more parks and green space (60.0% approval); and helping to ensure the safety of children to walk or ride their bicycles to school (69.1% approval).

PRIZM Lifestyle Geodemographic Segmentation

Another source of market research data is the current PRIZM system of segmentation that was developed through cluster analysis of integrated U.S. Census, sociodemographic, GIS address, and boundary file data, and data from the Simmons Market Research Bureau Adult Survey of media, product purchase, and lifestyle habits.[12] Similar in concept to multilevel modeling techniques,[13,14] 15 distinct social groups were initially distinguished on the basis of affluence and urbanicity. These groups were further subdivided on the basis of residence, additional demographics, and commercial consumer behavior data (from Simmons) to yield a total of 62 distinct neighborhood demographic/lifestyle clusters. These lifestyle clusters can be considered moderating factors that may influence levels of physical activity.

Data are currently available at the block group, census tract, ZIP code, city, county, MSA (Metropolitan Statistical Area), DMA (A.C. Nielson Designated Market Area), state, and national levels of geography for the entire United States. Included are approximately 250 sociodemographic items from the Census and 500 items relating to media preferences (television, radio, magazines, and newspaper), purchasing behavior and

product usage, lifestyle activities, and demographics by cluster membership within the geographic units being considered. Summary reports and maps can be produced for any of these items and for any geographic area of interest.

As mentioned, the PRIZM segmentation system includes several market databases derived from consumer surveys by Simmons. From this consumer survey data, 30 behaviors related to physical activity have been identified, including leisure activities and hobbies, such as outdoor gardening, cross-country skiing, swimming, sailing, hiking/backpacking, jogging/running, weight training, bicycling, in-line/roller skating, water aerobics, exercising at home or at a club, stationary bicycling, fitness walking, and racquet ball. One example of the use of PRIZM was a project conducted with a mid-sized community in southern Illinois (population 47,496). Selecting one particular ZIP code within this community to target, the demographic profile depicted primarily a low-income, low-education, older, black population in residence. A PRIZM cluster profiling of the block groups within this ZIP code revealed six distinct lifestyle clusters, with "Gray Collar" being the most predominant (44.06%). "Gray collars" represent a group of mainly highly skilled older adults, and are predominantly found in the Great Lakes industrial region. Using the physical activity behaviors selected from the market databases in the PRIZM system, outdoor gardening was the most prevalent by the Gray Collars cluster (41.2%), and the only behavior engaged in to a greater extent (on average) than those physical activity behaviors reported by the Simmons survey, weighted to the U.S. Census (40.5%).

Some data sets and segmentation systems such as Healthstyles and PRIZM are developed by private market research firms, and so their general use can be restricted based on licensing agreements with organizations, usually at the national level, which provide technical and financial assistance in their administration (e.g., CDC, National Institutes of Health, and American Heart Association). Although proprietary in nature, more researchers working within these support organizations and agencies are using these data for public health research and programmatic purposes. Constituents of these national organizations/agencies at the state and local levels, as well as other interested parties such as university faculty, can access this information through collaboration with their respective national partners or more directly with the research firms themselves.

Market surveys also suffer from some methodologic limitations, especially when compared to the national surveillance data sets previously discussed. The sampling methodology may preclude their use for providing national prevalence estimates. The psychometric properties are generally weaker, especially with respect to sampling issues affecting population representation, and instrument validity and reliability estimates may be lacking in detail. (For further information on these market data systems, contact Dr. Fred Fridinger at ffridinger@hsc. unt.edu.)

Using Outdoor Recreation Survey Systems

Outdoor recreation is one avenue for people to engage in physical activity and thus gain some level of improved physical fitness. Similar to the Healthstyles and PRIZM data systems just described, there are a number of private, proprietary surveys around the country that assess the public's recreational activities in the outdoors. Most of the survey firms or sponsors of these surveys do not release their databases, but all will sell reports and some will prepare custom reports under contract. Included are surveys done for the National Sporting Goods Association, the Outdoor Recreation Coalition of America, the American Recreation Coalition, and D.K. Shifflet and Associates.

National Survey on Recreation and the Environment

In addition to private, proprietary surveys, there are a limited number of public sector national participation surveys. The focus here is primarily on the National Survey on Recreation and the Environment (NSRE). The NSRE is a large in-the-home telephone survey of individuals aged ≥16 years. (See the web site at www. srs.fs.fed.us/trends for more information on the NSRE.) It enables tracking of long-term trends because comparability has been maintained since the first of the national recreation surveys was done in 1960, with approximately 60,000 respondents by the end of 2001. The managers of the NSRE intend that it will continue as the nation's federal outdoor participation survey with re-surveying to occur indefinitely at about 5-year intervals.

The survey covers a wide range of topics including varying types of recreational participation; physical activity mediating variables such as environmental attitudes and values; opinions concerning recreation management and management of public lands; and wilderness values, knowledge, and preferences for management. Modules of sponsored questions are administered to successive sample blocks of approximately 5000 respondents as the survey progresses. Recreation participation and demographics (moderators) are always included with each successive round of sponsored questions. The wide range of moderators and mediators within the NSRE enables more detailed multivariate analyses and thus much more comprehensive descriptions of different participant groups. As well, these variables provide measures for testing the validity of many of the behaviors as well as attitudinal and other scales. However, the validity of recreation

participation behavioral measures has not been established to the same degree as other self-report measures of general physical activity. Whether activity participation questions are measuring the intended behavior within the intended time frame with a common understanding of the activity in question is in need of closer scrutiny. On the other hand, the same activity participation questions applied successively across 12 samples of 5000 respondents each has revealed very consistent estimates of population participation rates from sample to sample.

All the instrument's demographic measures follow Bureau of Census standards and definitions. Demographic profile comparisons are made between resulting NSRE samples and the U.S. Census to determine needed weighting to correct for disproportionate representation within the samples. Often moderating variables such as age, race, gender, and income are not sufficient to describe who people are or to explain where outdoor recreation fits into their lives. In addition to standard demographics as used in the Census, a module has been designed and tested to describe lifestyles. Questions concerning lifestyle activities regularly participated in (e.g., dining out and going to movies) are included as a way of more fully understanding who people are. This lifestyle module greatly aids population segmentation.

The format and context of some of the original questions in the first and in successive national recreation surveys have been kept as consistent as possible over the years to enable participation and other trend analyses. In the 1960 National Recreation Survey, 23 outdoor activities ranging from playing outdoor sports and games to mountain climbing were included.[15] In each successive National Survey, activities were added as the scope of outdoor activities in which Americans were participating broadened. The current survey, NSRE 2000–2001, includes 77 specific activities that range from walking for pleasure, to snowboarding, to photographing natural scenery. The variety of recreation activities that Americans participate in has expanded enormously since the 1960s and the module in the NSRE has been broadened accordingly to accommodate these changes. Across all applications of the National Recreation Survey up to and including the NSRE, days of participation, as well as incidence of participation over a 12-month period, have been collected. The amount of participation is a better measure of whether a person participated at any level. Over different surveys, trends can be tracked for activities replicated from survey to survey to determine if participants are becoming more or less active.

Sources of sampling bias in the NSRE data are addressed through post-stratification weighting. An example of sampling bias is disproportionate rural sampling across the 50 states, which results in oversampling of rural populations as well as likely over-representation of affluent people in the survey sample due to random-digit dialing of phone numbers.

With the range of behavioral, moderator, and mediator variables in the NSRE data, numerous options are available for segmenting the U.S. adult public. For example, based on participation in activities (yes or no), eight clusters (segments) have been identified that differ substantially in their participation profiles. For example, the so-called "Nature Lovers" comprise 27.2% of the adult U.S. population. This cluster is so named because this group's outdoor activities are largely aimed at seeing, learning about, and appreciating nature, but are not particularly vigorously active. They participate little in consumptive (such as hunting) or motorized activities. With the demographic and lifestyle data in NSRE, profiles of the people who make up this segment can be constructed. For example, the majority are women, including large numbers of older women, who spend a substantial amount of their time with their grandchildren. They exhibit concern over the environment as well (i.e., they tend to read environmental magazines and believe that humans are abusing the earth).

The other seven population segments that have been identified through cluster analysis of participation in recreation activities are the "Urban Beach Boys" (3.8%), "Inactives" (22.0%), "Young New England Wind Surfers" (0.9%), "Noreaster Musclers" (6.2%), "Men's Hunt-n-Fish Club" (6.3%), "Take It Easies" (25.3%), and the "Thrill Seekers" (8.3%). All eight of the outdoor, lifestyle-cluster segments represent a different challenge to the public health community. Different recreation choices, lifestyles, environmental attitudes, and demographics make each group unique. These unique profiles offer pathways for working with and contacting these different population segments and for encouraging more physically active outdoor participation.

In addition to the eight outdoor segments, a number of other groups can be identified based on NSRE participation data. One such group can be labeled the "Enthusiasts." This group includes participants in any given activity who are the most active one third of the population. Identification of which mediating factors make this group of participants the most active people in outdoor recreation include environmental attitudes and constraints to recreation participation such as perceived safety and crime. The influences of moderating variables such as race/ethnicity (mostly white), gender (males), age (<40 years), income ($25,000 to $75,000), living arrangement (two-person households), and education (high level) have also been assessed. Also identified are survey respondents who are the least active; that is, the least active one third of the population in the United States. This group tends to be older (almost one quarter aged >65), disproportionately black or Hispanic, have less education, from the eastern

Group	Walking	Swimming	Hiking	Driving off-road	Downhill skiing	Big game hunting
Percentage of total population (based on survey sample response)	83.8	43.8	33.4	17.4	8.3	8.2
Race/ethnicity (% participants/% of total population)						
White	1.02	1.15	1.03	1.13	1.20	1.28
Black	1.00	0.49	0.34	0.63	0.33	0.27
American Indian	1.00	1.00	1.14	1.57	1.57	2.00
Asian/Pacific Islander	1.08	0.92	0.96	0.85	1.46	0.23
Hispanic	0.88	0.75	1.42	0.74	0.55	0.43
Place of birth (% participants/% of total population)						
United States	1.02	1.04	0.93	1.05	1.05	1.07
Outside United States	0.81	0.56	1.67	0.48	0.44	0.30

United States, tend not to take vacations away from home, and are less likely to exercise three or more times per week. Why this group in American society is relatively inactive is not addressed by the NSRE, but it is an extremely important question for the public health community to address.

In addition to grouping people by level of engagement in outdoor recreation, differences have been explored across various population segments. This can be performed across any demographic or other respondent characteristic. One method of doing so is to identify who is over- or under-represented in activity participation. This can be accomplished by computing a ratio between the percentage of a particular group (such as Hispanics), which participates in an activity and the percentage this group contributes to the overall population (see Table 1). By examining this ratio one is quickly provided an identification of which social strata are over- or under-represented as participants in any given activity. A ratio of >1.0 indicates over-representation and thus identifies whether any given activity is favored by the strata being examined. A ratio of <1.0 indicates under-representation. Comparing participation ratios across demographic strata for walking in Table 1, for example, shows that all groups are roughly proportionately represented among participants. But, in examining an activity like outdoor hiking, we find that blacks do not hike very much, while whites, American Indians, and especially Hispanics and people born in another country are much more likely to engage in this activity.

There are a number of valuable conclusions that can be drawn from the data. For one, participation and interest in outdoor recreational pursuits generally are growing steadily over time. This obviously indicates an opportunity to entice greater involvement in more physical activity. In addition, interest in some lower-energy activities (e.g., bird watching) is growing more rapidly than interest in others. This represents an opportunity to tie physical activity to the latest outdoor fads. The growth and interest in motorized activities may appear to run against physical activity promotion efforts but the data show some promising links. The population segment most into motorized forms of outdoor activities, which represents about 8% of the U.S. adult population, also are into swimming (74% participate) and walking (82%).

There is no question that the usefulness of the NSRE to the public health community can be improved. Future efforts might include partnering with other organizations to assess which respondents participate and those who do not and why. In addition, the U.S. Department of Agriculture Forest Service is interested in identifying constraints to participation that are beyond the control of the potential participant. Other potential areas to explore include public knowledge related to the benefits of exercise, or comparing self-reported ratings of health relative to their participation profile.

As NSRE sponsors receive and publish their data, data will be released to other academic and agency researchers. Data from the 1994–1995 NSRE are available by contacting the U.S. Forest Service in Athens, Georgia. For further information that provides a statistical breakdown of outdoor recreation in the United States, consult Outdoor Recreation in American Life.[16] Another text, Outdoor Recreation for 21st Century America,[17] reports on the current findings of the NSRE.

Summary

We described the use of national epidemiologic and surveillance public health data sets, as well as more nontraditional market research survey data, for physical activity research. Each of the public- and private-sector data sources, including those which are health and nonhealth (consumer-lifestyle) oriented, has its own inherent weaknesses and strengths (Table 2). For in-

Table 2. Characteristics of selected surveillance and market survey data

Source	Domain	Type	Potential for mediator variable inclusion	Psychometric properties (validity, reliability, and sampling)
Public health surveillance data				
NHIS	Public	Cross-sectional	Low	High
BRFSS	Public	Cross-sectional	Low	High
YRBSS	Public	Cross-sectional	Low	High
NHANES	Public	Cross-sectional	Low	High
Omnibus survey/geodemographic system lifestyle data				
American Healthstyles project	Proprietary	Cross-sectional	High	Low/medium
PRIZM	Proprietary	Cross-sectional	High	Low/medium
Outdoor recreation survey systems				
NSRE	Public	cross-sectional	High	Medium

BRFSS, Behavioral Risk Factor Surveillance System; NHANES, National Health and Nutrition Examination Survey; NHIS, National Health Interview Survey; NSRE, National Survey on Recreation and the Environment; YRBSS, Youth Risk Behavior Surveillance System.

stance, even surveillance and epidemiologic data are cross-sectional, and as such can be used only to assess associations between variables within sample populations. Mediator- and moderator-type measures are included only sporadically in most national data sets, and usually only on alternate-year modules, for only part of the sample population, or both. In both surveillance and market surveys, following a cohort over time is not normally feasible.

As mentioned previously, the psychometric properties of market research surveys usually are limited, especially with respect to validity, reliability, and sampling issues (although sources of sampling bias with market surveys are normally limited through post-stratification weighting and oversampling under-represented subpopulations). In Healthstyles and other market surveys, panel sampling rather than random sampling is used to increase response rates, reducing the capacity to generalize the results. Specialized software (e.g., SUDAAN) may be needed to account for clustering, stratifying, and weighting to get accurate error estimates for inferential statistics. In addition, many market survey databases are private and proprietary, and either can be expensive to acquire or availability to public health professionals is limited.

These data sources are not without their respective strengths, however. The epidemiologic and surveillance data systems, such as the BRFSS, tend to have better validity and reliability characteristics, especially when compared to smaller or proprietary surveys. Even though trend data are hard to obtain with modifications in questionnaires over time, the associations between physical activity and other pertinent variables can be assessed within the allotted time frame that the data are collected. Surveillance data can provide population-prevalence estimates, monitor trends across the country and enhance our understanding of physical activity patterns and correlates within the population.

Market survey data can complement national surveillance data by adding new dimensions to our understanding of target audiences and facilitating better tailoring of physical activity messages and programs through the mediating effects assessed within these nontraditional data sources. When compared to epidemiologic or surveillance data, they tend to be more innovative and flexible. Because market surveys tend to be omnibus in nature and allow for organizations to include specific items, costs can be spread out and comparability of items over time can be more readily achieved.

Opportunities to add mediator-type measures on annual market surveys are usually possible. A wide range of mediator and moderator variables within both private and public market-segmentation surveys, such as the NSRE and Healthstyles, enables more in-depth multivariate analyses, which not only provides more complete profiling of target groups but also further examination of these types of measures vis-a-vis physical activity.

Recommendations

There is much that can be done to improve the utility of national surveillance data sets, such as incorporating objective measures of physical activity. Linking these surveillance data with other national or local data sets, such as through common geographic identifiers, would likely increase the efficacy of their use for program purposes, as well as help define and understand the role of mediating variables. As much as possible, the wording of items must be consistent when the instrument is administered over time in order not to affect the prevalence of physical activity and other measures.

For market research surveys, better testing of item construction, validity, and reliability is necessary, but not at the expense of providing information in a timely

fashion. Where possible, market surveys should incorporate valid and reliable items from national surveillance surveys, such as those discussed here. This would allow the prevalence and incidence of types of moderate and vigorous physical activity to be linked to other variables. These items should also be kept as consistent as possible over time for trend analyses.

Professionals who have access to and use proprietary market data should endeavor to make their analyses and findings available to those who could benefit from this type of information. Likewise, the few public sector national surveys, despite their limitations, should continue to be made available to the greater scientific community.

Perhaps most important of all, researchers should continue to pursue collecting and analyzing data across both public and private sectors. The combination of epidemiologic, surveillance, and market data increases the capacity for achieving greater effectiveness in physical activity research and programs.

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